Mapping Higher Education in Pakistan

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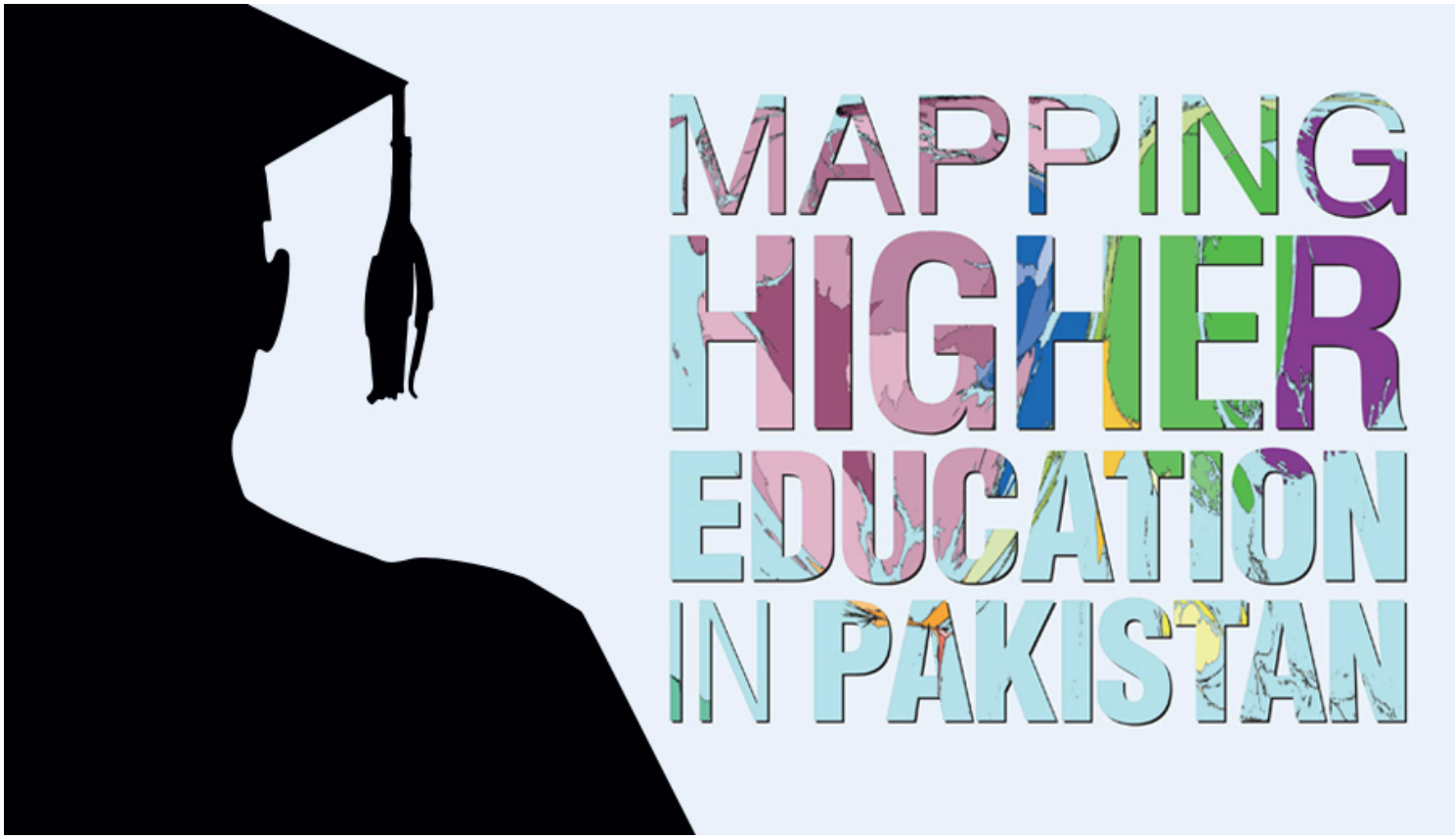


by Khalid Khattak (https://web.archive.org/web/20191230115559/https://twitter.com/Khalid_Khattak)

Are there enough opportunities and conducive environment for researchers and scientists to make a real difference? An analysis of higher education in Pakistan.

Starting its journey in 1947 with only one university, the University of the Punjab (established in 1882), Pakistan today has 177 universities and degree awarding institutions (DAIs), spreading across its map and the number is growing fast. Of these 177 universities and DAIs, 103 are public while the rest have been established by the private sector. The government has awarded charter to 33 of these universities and DAIs while the rest have been chartered by the respective provincial governments. The federally chartered universities and the DAIs are mostly located in the federal capital, Islamabad, but some operate in other cities of the country too. For example, the Karakoram International University is a federal chartered university and is based in Gilgit-Baltistan.

Pakistan's most populous province, Punjab, with an estimated population of over 90 million, half of the country's total population, is on top of the rank with its 51 chartered universities and DAIs (27 public and 24 private) while the Sindh province, which has almost population equal to half of Punjab's, ranks second with its 49 universities and DAIs. But unlike Punjab, Sindh province has more private universities and DAIs as only 20 out of 49 are public.

Khyber Pakhtunkhwa (KP) has 29 universities, Balochistan province eight while there are seven universities chartered by the Azad Jammu & Kashmir (AJK) government.

PhDs produced in Pakistan since 1947

From 1947 to 2014, Pakistan's higher education institutes (HEIs) produced 11,988 PhDs. As of 2014, Pakistan, having an estimated population of over 180 million, had student enrollment of 1.4 million, including over 900 foreign students and Afghan refugees, studying in various HEIs. The percentage of female students in the HEIs was around 40 percent.

From 1947 to 2002, Pakistani universities had produced only over 3,000 PhDs. However, the country witnessed a sharp rise vis-à-vis PhDs produced per year. From 202 in the year 2001 before the Higher Education Commission (HEC) was established, to 1,211 PhDs in year 2013 and 1,325 PhDs in the year 2014.

Most of the PhDs, 1,541, were produced in Language and Literature, followed by 1,462 in Chemistry and 933 in Agriculture. Up to the year 2014, the country's HEIs had produced only 500 PhDs in Engineering and Technology while 908 PhDs were awarded in Religious Studies.

The University Grants Commission (UGC) which drew its powers from The University Grants Commission Act, 1974 was replaced by the Higher Education Commission (HEC) in 2002.

A comparison of funding to the universities by the UGC and the HEC is enough to understand the level of commitment to higher education by the successive governments in Pakistan. The UGC provided funding of PKR 7,538.835 million to the universities from financial year 1978-79 to 2001-02 while after the establishment of the HEC, a whopping PKR 115,413.194 million have been pumped into universities by the commission from the financial year 2002-03 to 2015-16.

University education versus school education

The Pakistani universities and DAIs are offering academic and research programs in anthropology, agriculture, space sciences, fisheries and aquaculture, computer science and IT, business and management, engineering and technology, veterinary science, psychology, so on and so forth.

With institutes of higher learning like the Virtual University (VU), the country's first university based completely on modern information and communication technologies offering academic programs while "using free-to-air satellite television broadcasts and the Internet" and the Information Technology University (ITU) which is nurturing "an environment of hightech research and entrepreneurship with its state-of-the-art facilities, world-class faculty, in-house startups incubator and well-established government and industry linkages," Pakistan's higher education landscape is certainly versatile.

The Pakistan Education and Research Network (PERN), an initiative of the HEC, launched in 2002, is providing communication infrastructure to the 250 plus universities and institutes of higher learning, including colleges and research organizations of the country to meet their networking and internet requirements.

Whereas, as per the latest Pakistan Education Atlas, a staggering 46 percent of public sector primary schools (124,284 primary schools) in Pakistan are without electricity. The Pakistan Education Atlas, prepared by the federal government's Academy of Educational Planning and Management (AEPAM) and UN World Food Program, was launched in September 2015. Besides many others, the country's school education system is facing challenges of missing facilities. Luckily, most Pakistani universities do not face such challenges.

Scholarships galore

Presently, there are some 40,000 faculty members in public and private sector universities and DAIs of the country and only about 10,000 of them are PhDs which makes it a 25 percent of the total teaching strength in Pakistani universities.

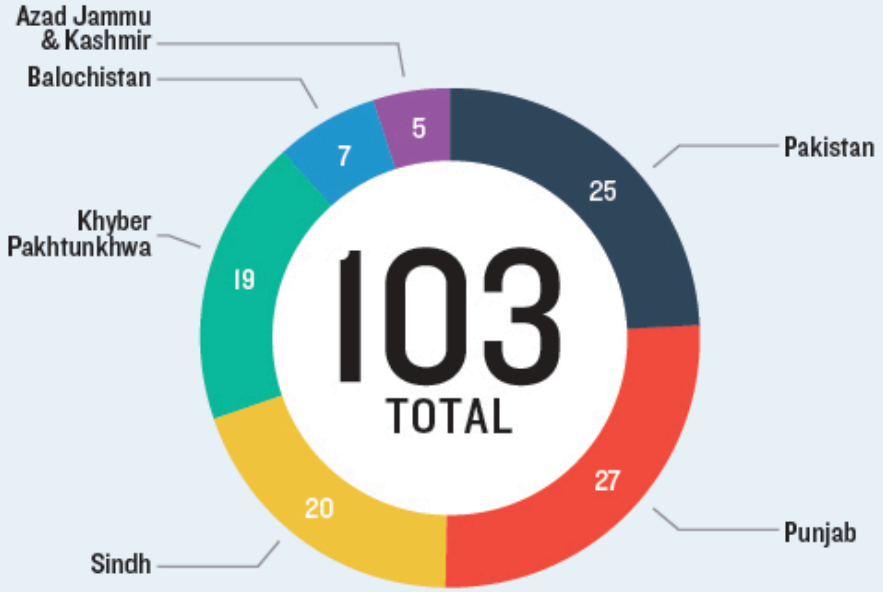
After the establishment of the HEC, Pakistan witnessed a kind of 'revolution' in indigenous and foreign scholarships for MPhil and PhD programs both for the faculty members and the students.

The HEC, under its Faculty Development Program (FDP), has so far awarded 2,450 foreign scholarships, executed by universities and DAIs, with maximum 938 scholarships in the discipline of Engineering and Technology. These are followed by 493 scholarships in Physical Sciences and 431 in Social Sciences.

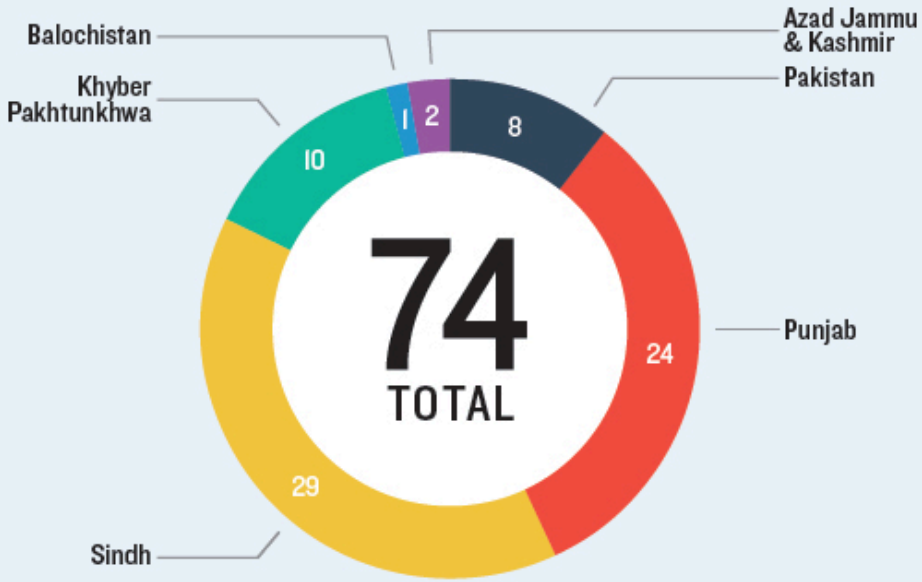
So far, the HEC has sent 7,806 Pakistani students under its Overseas Scholarships Program out of which 5,683 have returned while 2,123 are currently pursuing MPhil leading to PhD or PhD programs abroad. Those who have returned 1,874 scholars completed their studies in Biological and Medical Sciences, 1,406 in Physical Sciences and 979 in Engineering and Technology.

Of those who availed Overseas Scholarships, 1,341 were sent to United States, 1,226 to United Kingdom and 907 to Cuba.

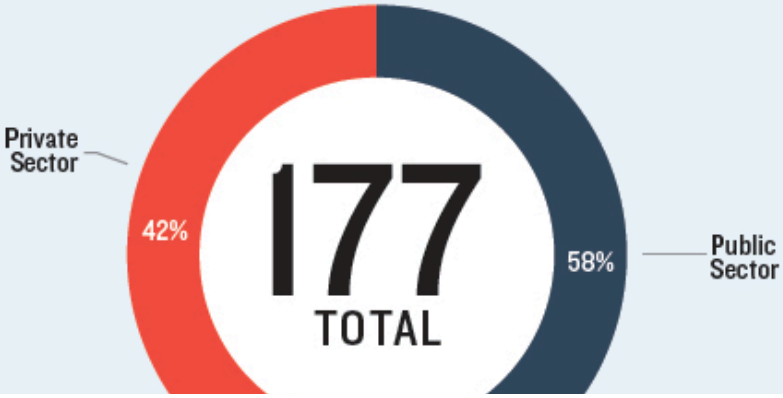
Public Sector Universities



Private Sector Universities



Total Number of Universities



Source: Higher Education Commission

Apart from these, the HEC has, so far, awarded 9, 278 indigenous scholarships out of which 2,333 scholars have completed their studies, while 6,945 are currently enrolled. Most of these scholarships, 2,468, are from the discipline of Physical Sciences, followed by 2,174 in Biological and Medical Sciences and 1,293 in Agriculture and Veterinary Sciences.

The big question

Despite the amazing transformation of higher education sector of Pakistan over the years in terms of improvement in infrastructure and growing numbers of PhDs, one of the big questions is whether there are opportunities and environment for researchers and scientists to make a real difference by solving actual problems of Pakistan. The other questions are related to creation of new knowledge, enough number of researchers, adequate research labs and think-tanks and significant achievements in science and technology.

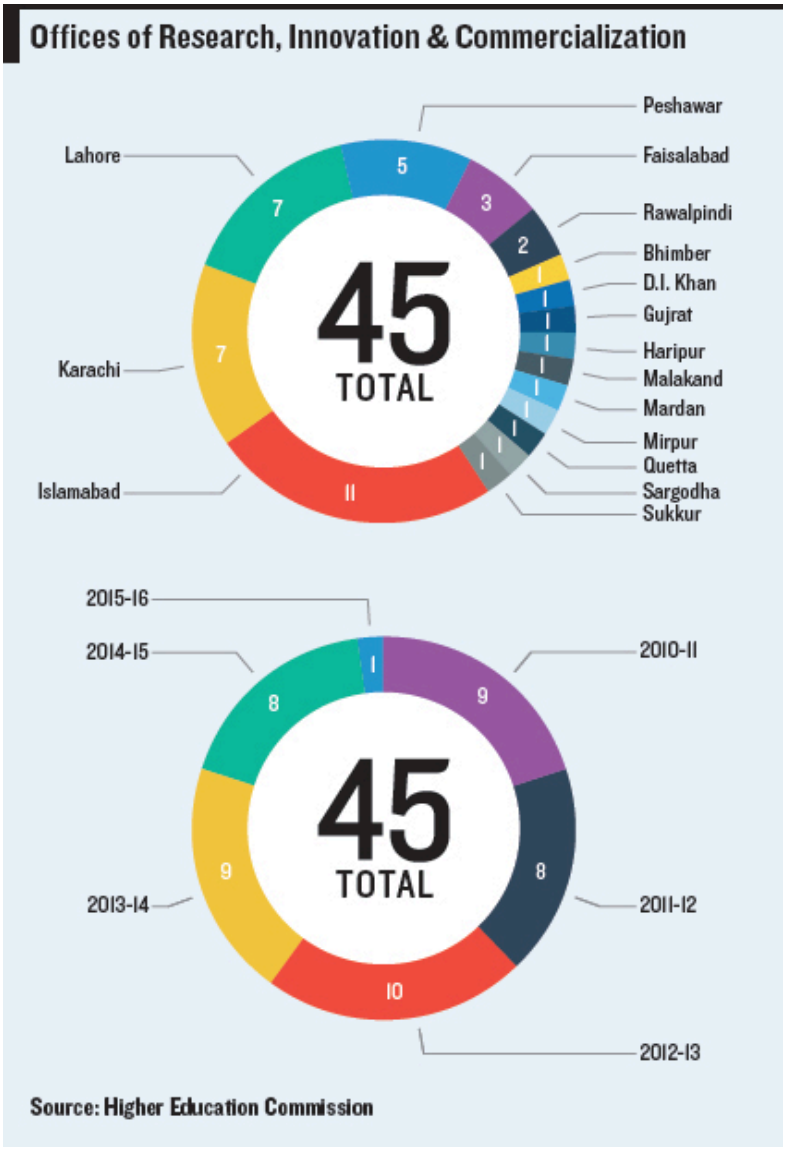
The whole debate revolves around the big question, i.e., whether our universities are acting as catalysts for change by improving the socio-economic, economic landscape of Pakistan, the first nuclear power in the Muslim world.

Academics believe that Pakistani universities should work as research centers because, they argue, research output is directly linked with development by fighting the challenges faced by the country. This also matches with the HEC's mission of facilitating the 'institutions of higher learning to serve as an engine of socio-economic development of Pakistan.' The academics also frequently highlight the need of promoting research culture in universities and allocating the maximum resources for in-house research and development (R&D) facilities.

There are different parameters and indicators to measure the performance and research output of a university. With slight variations, many of these indicators are also used by national bodies (like HEC) and international bodies like QS World Universities Rankings, World University Rankings and Times Higher Education.

These are: teaching and learning environment, research and its influence and impact, including citations, patents and international outlook both in terms of faculty and students. From only 877 publications indexed in the ISI Web of Knowledge in the year 2001, Pakistan had 8,163 publications indexed in the Web of Knowledge by the year 2014.

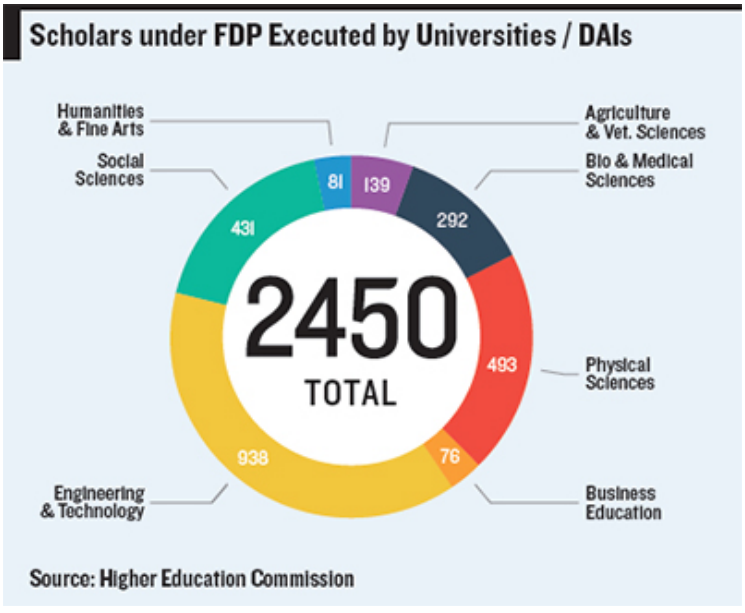
Since 2006, a total of 73 patents have been filed by Pakistani universities and so far only 22 have been issued. Most of these patents, 34, have been filed by universities from Karachi (Sindh), 20 from Punjab, three from KP and 16 from universities and DAIs of the federal capital, Islamabad. No patent has been



filed from universities of Balochistan. Of those issued, universities of Sindh lead with 12 followed by eight of Punjab and two universities of federal government.

Analyzing the data further, out of 22 registered patents, 14 are for medical or medicinal purposes, two are related with agronomy, three are related with communications and computer sciences, one each for petroleum industry, food industry and, last but not the least, for general industrial use. Our first international patent of the year 2015 was awarded by the United States Patent and Trademark Office to Government College University (GCU). Nano-Leucite Fertilizer, invented by a group of GCU scientists, is a specialized slow release nitrogenous fertilizer in which there is a minimum nutrient loss due to leaching. In more scientific terms, the Potassium Aluminum Silicate (Leucite) nanoparticles occluded by calcium ammonium nitrates are slow release fertilizers and are synthesized by hydrothermal method.

GCU's patent for Nano Fertilizer "produces healthy food and significantly increases the crop yield." GCU terms it a "revolution for green environment as it ensures minimum nutrient loss in food and increases overall production.



The question remains, are our researchers undertaking any useful or meaningful research that solves Pakistan's real problems or leads to commercially viable products or inventions?

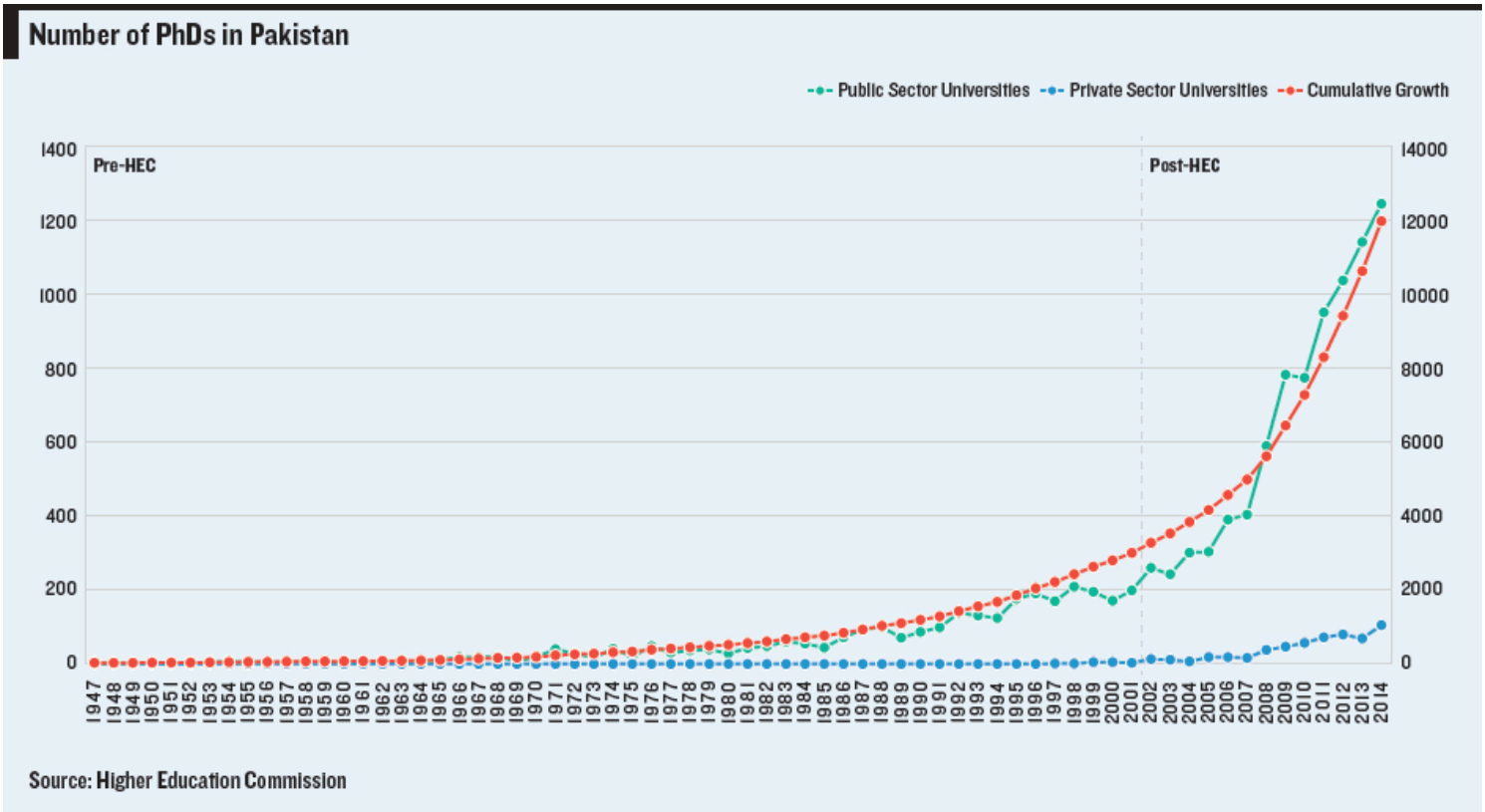
The Intellectual Property Office of Singapore (IPOS) defines patent as "a right granted to the owner of an invention that prevents others from making, using, importing or selling the invention without his permission. A patentable invention can be

a product or a process that gives a new technical solution to a problem. It can also be a new method of doing things, the composition of a new product, or a technical improvement on how certain objects work."

Key Performance Indicators

"A sea change has occurred in universities in Pakistan," asserts Dr. S. Sohail H Naqvi, vice chancellor of the Lahore University of Management Sciences (LUMS). "Many more research centers have been established in almost all areas of knowledge," he claims.

"As a country of nearly 200 million people, however, much more needs to be done," he adds while saying "support for carrying out research is also severely restricted that limits the ability of universities to carry out research."



Dr. Naqvi, who has also served the HEC as its executive director for eight years, is of the opinion that measuring performance of a university is a very complex task and is not dependent on one parameter ever. "Each university is different and its performance has to be measured against its vision and mission. Research publication is just one measure of a research university. Other parameters would include strength of postgraduate programs, placement of graduates, reputation among employers and international collaborations."

He says there is an endless array of projects that have benefited Pakistan, including development of cancer medicine, low-cost treatment of locally important diseases such as leishmaniasis, high yield disease resistant crops, and rapid image processing technique for guidance systems and industrial

policy. The list is long and one that the country can be justifiably proud of. “Pakistan is poised to become a major avenue of high quality research in the world.”

At the same time, Dr. Naqvi feels that Pakistan is not focusing on science and technology at all. “The appreciation of this crucial area that is fundamental to the development of a knowledge economy is missing completely. Funding support is not there as well, making it extremely difficult for researchers to carry out their work.”

To a question, Dr. Naqvi says: “LUMS is different because of its focus on the student. We provide them with the opportunity to discover themselves, encouraging them to take different types of courses. Outside the classroom the student societies provide an avenue to students to explore their interests and develop leadership skills. They are also provided opportunities to engage in research at the undergraduate level.”

“To a fair extent performance and output of universities can be measured through the research papers produced by faculty of a university,” says Professor Dr. Mujahid Kamran. He is the vice chancellor at the University of the Punjab. “It is not important just to see how many research papers a university has produced but how many of these have been cited,” he explains.

Dr. Kamran, a teacher and a theoretical physicist, also says, “Research output of a university also depends on the number of undergraduate and graduate (MPhil/PhD) students. According to MIT Facts 2015, graduate students constitute 60 percent of the total 2014–15 student population at the Massachusetts Institute of Technology (MIT) while Harvard University has 69 percent graduate and professional students.”

Dr. Kamran, an ardent advocate of the role of universities in creation of new knowledge, adds that before he took charge as vice chancellor in 2008, the University of the Punjab had less than one percent graduate students. “Today, 13.4 percent students of the university are doing MPhil and PhD.”

According to him, the university had only 29 percent PhD faculty before 2008 while it is over 50 percent now. “We made this achievement through the HEC overseas scholars who returned after completing their studies and through university’s own foreign and indigenous scholarships for faculty members,” he adds.

Dr. Kamran says patents issued to faculty of universities also explain research output and performance of a university and its role in socio-economic development of a country and the benefits of research reaching to common man.

“The higher education sector is growing and expanding which is a good thing,” remarks Professor Dr. Fazal Ahmad Khalid. He is the vice chancellor at the University of Engineering and Technology (UET) Lahore. “However, what is needed at the moment the most, is quality,” he adds. “This growth and expansion of higher education also requires a serious look, suggesting long term planning by the universities, especially vis-à-vis China-Pakistan Economic Corridor (CPEC),” he comments.

Mentioning various prevailing and emerging challenges such as energy crisis and water shortage, he says the universities need to focus on them. “We have not been able to make much progress in fields such as nanotechnology and biotechnology and we should focus on these areas, as well.”

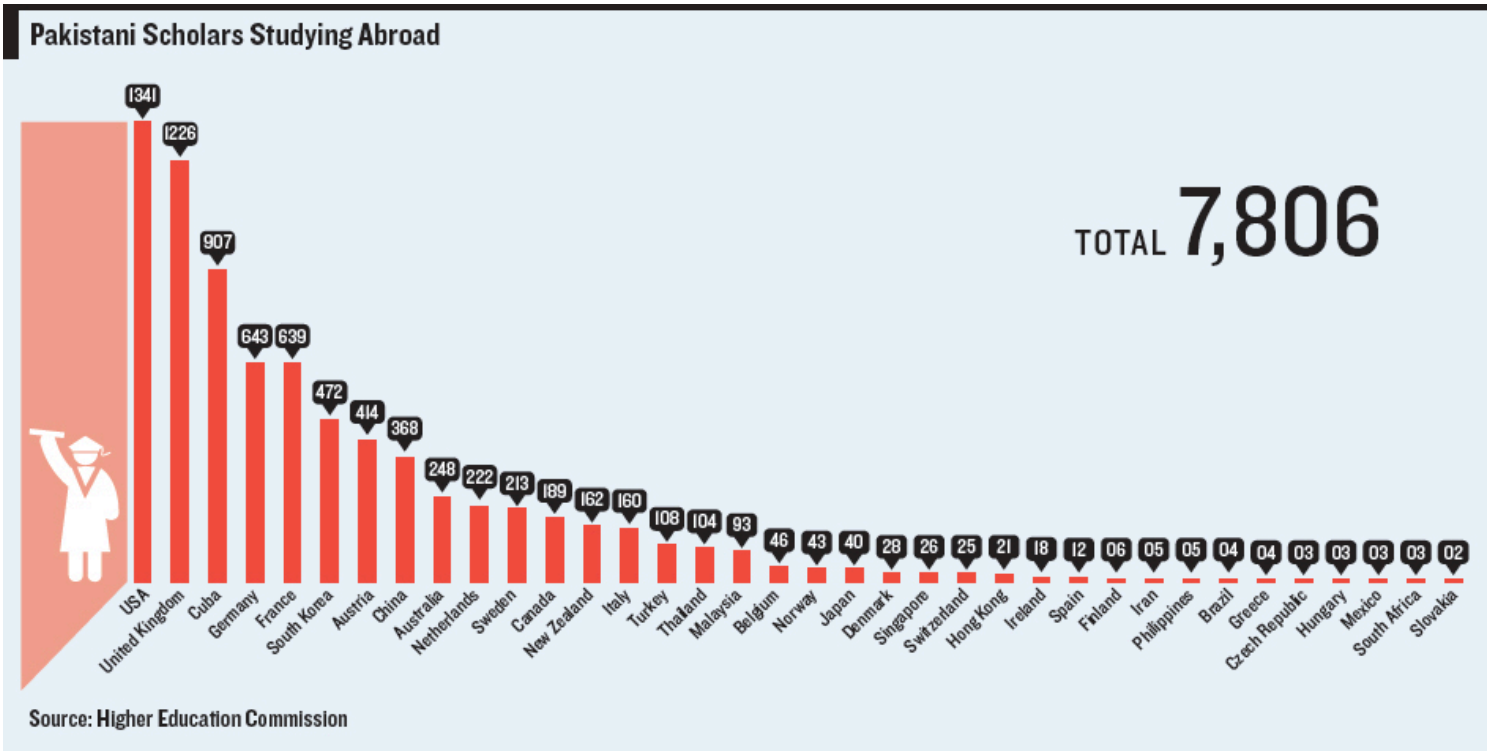
Professor Khalid underlines the importance of student teacher ratio (STR), especially increased number of PhD faculty for what he terms ‘outcome-based education’.

According to him, the level of research being carried out by Pakistani universities needs to improve and technologies should be developed to solve problems faced by the industry and transform information society into a knowledge society. He stresses the importance of innovation and entrepreneurship for the universities.

“The higher education is in a transitional phase,” he maintains. He highlights the need of “increasing the education budget to four to five percent of the GDP with focus on higher education and science and technology,” in conclusion.

HEC Chairperson Professor Dr. Mukhtar Ahmed believes in creating an environment for universities where high-end research and new knowledge can be produced with subsequent grand objective of actually contributing towards socio-economic development of the country and benefitting the common man.

Dr. Ahmed, who had been deputy director general of Islamic Educational, Scientific and Cultural Organization (ISESCO) in Rabat, Morocco, says that over the years, the HEC has tried to play the role of providing required environment to universities to grow and become research-led universities.



According to him besides some other challenges, “tertiary education access rate, presently 8.3 percent, is one of the biggest.”

He says tertiary access rate in Pakistan was only 2.6 percent in 2002. In many developed countries like South Korea, this access rate is over 90 percent. “Even neighboring India is ahead of us with having access rate in two digits.”

Dr. Ahmed expresses concerns over the government’s spending only 0.2 percent of the GDP on higher education as he says any good university of the West has budget which is more than the entire funding for the HEC.

Talking about low number of patents issued to Pakistani universities, Dr. Ahmed argues that after years of hard work and subsequent support from the government, we have now reached the point where we can come out of the numbers game and position our universities towards meaningful research.

There is no doubt that earlier, our universities were doing research for the sake of research, but now our institutes are moving fast towards progressive development. Today, the HEC is supporting universities to file patents by paying registration and even renewal fee, which was never done in the past,” he confirms.

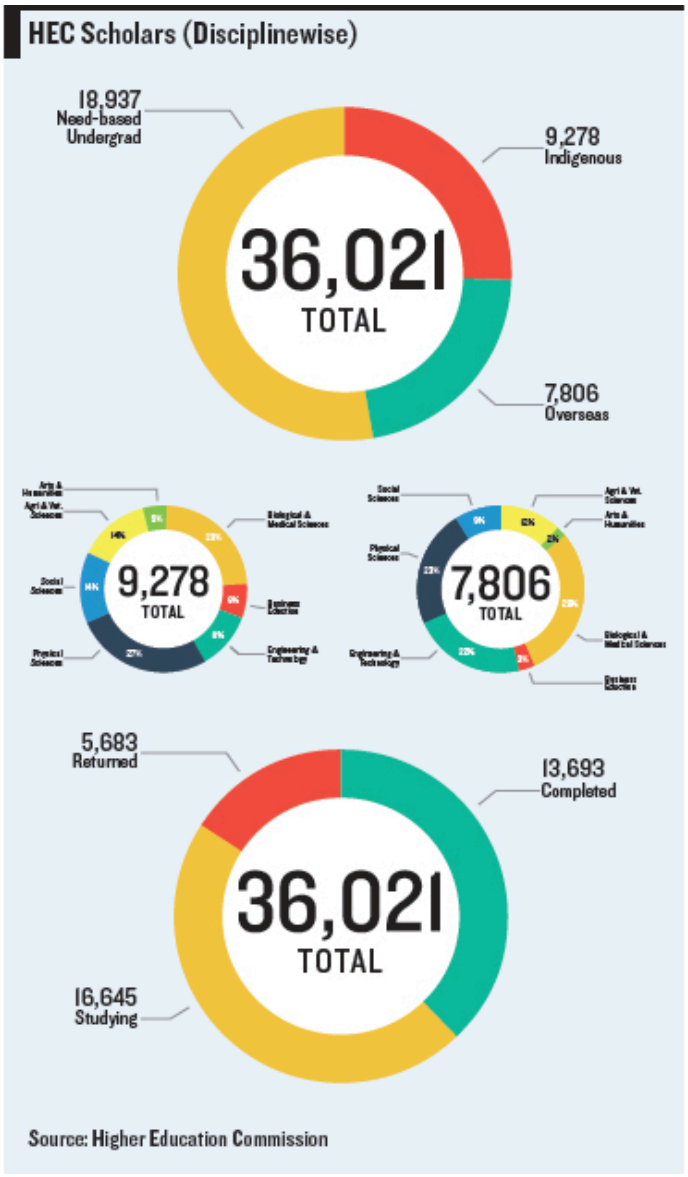
Further elaborating research environment for universities, the HEC chairman says total research papers produced by universities and DAIs of the country were over 12,000 in the year 2014 and 8,163 of these were published in journals with high impact factors which is a good sign.

He agrees with the point of view that undergraduate strength of students affects the overall research performance and culture of a university and says, therefore, the HEC is now targeting a few universities to turn them into centers of excellence where focus will be high-end research. “We will push universities for innovations, patents and commercialization of their research,” he declares.

“The Faculty Development Program was designed keeping in view demand of the universities for highly qualified faculty in various disciplines,” continues Dr. Ahmed. He adds that earlier a quota policy for Science and Technology and Social Sciences was followed; however, the program is now open for provinces as per their demand of faculty by universities in different fields and disciplines.

While explaining the challenges vis-à-vis scholars who returned after completing higher studies under the overseas scholarships, Dr. Ahmed says though many of them are inducted in universities and some, who had signed bonds with their parent organizations, have to spend a specific time in their respective organizations immediately after their return.

“Most of them desire to be placed in universities of big cities while the need is somewhere else,” the HEC chairperson says while adding, the commission is focusing more on creating environment in universities where such scholars are adjusted and their expertise can be utilized.



Dr. Ahmed further says many new universities are in the pipeline. “We only mention those universities on our website which have got our ‘No Objection Certificate’ (NOC). The next time you will visit HEC website, you may find information about new universities.”

Future plans in higher education

There are two big challenges before the HEC vis-à-vis the higher education sector, i.e., quality and governance of universities. HEC Chairperson Dr. Ahmed vows to address the two on an immediate basis.

There is an impression as if the HEC is taking action only against private universities and DAIs. “Quality cannot be compromised and the HEC has the same yardstick for public and private universities in this regard,” he says.

The commission recently held a series of consultative meetings to chalk out strategy to accelerate its efforts from lessons learnt in the past and introduce meaningful reforms. The former heads of the HEC and other stakeholders had been part of these discussions.

According to Professor Dr. Mukhtar Ahmed, future thrust will be excellence in higher education, technology readiness, spirit of entrepreneurship, socio-economic impact and global perspective etc.

Keeping in view low tertiary education access rate, the present government has an ambitious plan of increasing this access by establishing campuses in every district of the country and for this the HEC is working closely with provincial governments to identify districts where new campuses of existing public universities can be established.

“In order to commercialize research, Offices of Research, Innovation and Commercialization (ORICs) have been established at 45 universities and DAIs across Pakistan and many more would be established soon,” he explains further.

“The HEC has also been working on the concept of Smart Universities and Smart Classrooms through which besides WiFi enabled campuses, the universities will offer interactive teaching and learning experiences to students and faculty members. For example students of Balochistan University could

attend lecture of a faculty member at Quaid-i-Azam University (QAU) Islamabad. The concept is different from video conference and also features a dashboard for faculty members to store their lectures and assignments etc."

"A project worth around PKR 3 billion has been approved to transfer knowledge and technology amongst universities and R&D organizations, directed at the industry to solve their problems." He also says PC-1 of the country's first ever 'Skill University' has also been submitted to the federal government.

He terms China-Pakistan Economic Corridor (CPEC) 'a really big opportunity' and says proper homework needs to be done. He further says a think-tank has already been formed at HEC to monitor and push universities forward to get maximum benefit. As many as 50 Chinese universities will be linked with Pakistani universities, he adds.

The HEC chief says there is another exciting concept Pak-US Knowledge Corridor, a brainchild of Federal Minister for Planning, Development and Reforms Ahsan Iqbal, under which different small projects have already been submitted. One of these is to send 10,000 Pakistani students to the US for PhD in coming years. "We are not asking for scholarships but seeking a special window through which Pakistani students studying in the United States will be charged fee as charged to in-state (local) students."

Presently, the cost of studying in the US is higher than Europe and the HEC spends around PKR 8 million to 10 million on each PhD student to study in European countries. The cost of a PhD in USA is around PKR 20 million and the new collaboration with the US will bring down high fee to an affordable level.

He further elaborates: "the HEC is presently also identifying Pakistan universities to bring international students to ensure diversification at our campuses. In the past, different countries, especially the entire Middle East, used to send its students to Pakistan. Today, there are a few in different medical and engineering universities of the country. We need to focus on this area too as this is also important for the country's international outlook and image," he concludes.

Federal HEC and provincial HECs debate

During the last few years the provincial governments of Sindh and Punjab established their respective provincial higher education commissions, i.e., Sindh HEC and Punjab HEC.

Such provincial bodies are yet to be formed, if any, by the governments of KP and Balochistan.

As the situation unfolded, the need was felt to define the roles of all the three HECs. In this regard, Prime Minister Nawaz Sharif constituted a committee, headed by Minister for Planning and Reforms Ahsan Iqbal. The committee has held three meetings so far and has yet to finalize its recommendations.

The provinces argue that under the 18th Amendment to the constitution, education has been made a provincial subject and it is the right of provinces to set up their own bodies.

However, the HEC officials argue that the Supreme Court, in its 2011 judgment, made it clear that "the status of HEC shall remain intact unless it is changed through new legislation."

HEC Chairperson Professor Dr. Mukhtar Ahmed says the existing functions of HEC were mostly covered under the Fourth Schedule in Article 70(4) of the Federal Legislative List 1 and 2. He agrees that roles of the three HECs should be defined. Professor Ahmed says there should be one national body; otherwise, national integrity might suffer, while different HECs with no defined roles might also affect student mobility within the country and abroad. He questions the need for so many bodies, "if all the federating units of the country started establishing their own HECs, what message we will give to the world," he asks. "Will we need accreditation councils such as the Pakistan Medical and Dental Council (PMDC) and Pakistan Engineering Council (PEC) at provincial level too?"

Terming inconsistency in policies a big problem, he thinks that instead of replacing the HEC, it should be appraised if it is delivering or not.

"There are two dimensions to the issue, i.e., legal and practical," says Dr. Mohammad Nizamuddin. He is the chairperson of Punjab Higher Education Commission (PHEC). "Practically speaking, it is difficult to centrally manage so many existing and growing universities and DAIs," he argues, saying decentralization is needed for efficient management.

He also says recommendations of the 18th Amendment Implementation Commission vis-à-vis new role of the Higher Education Commission as the 'Commission for Standards in Higher Education institutions' should be implemented.

Khalid Khattak is Education Correspondent at Pakistan's widely circulated English newspaper, The News International. He loves spreadsheet and data storytelling and blogs at www.datastories.pk

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